

A single-user, desktop system for Artificial Intelligence application development, programming and delivery systems. Features powerful standalone processing capabilities and ability to access host computing systems.

# ARTIFICIAL INTELLIGENCE SYSTEM

- 68020 32-bit CPU with 68881 floating point co-processor
- Tek® Common Lisp, MPROLOG™ and Franz Lisp available as options
- Includes the Smalltalk-80™ programming environment
- Bit-mapped graphics with mouse or joydisk input

The Tektronix 4405 Artificial Intelligence System joins the Tek 4404 and 4406 to offer a complete family of AI application development tools and delivery systems. The Tek 4405 sets new price-performance standards for machines of its class by offering a complete, state-of-the-art, personal AI development system that rivals units costing much more.

Delivering significantly more processing power than the 4404, the Tek 4405 is ideally suited for larger AI efforts. It provides all the software and hardware capabilities needed for developing major artificial intelligence programs. The 4405's advanced languages make it an excellent exploratory programming and software prototyping tool.

### A wide range of AI programming languages

All of the major AI languages in use today are represented on the 4405 including Tek Common Lisp, Smalltalk-80, MPROLOG and Franz Lisp. This offers AI researchers and developers a clear choice of leading edge programming environments—all accessible from a single desktop device, all fully compatible with the entire Tek family of 4400 Artificial Intelligence Systems.

To complement the 4405, the Smalltalk-80 programming environment is included standard. This exploratory programming tool offers a highly integrated, object-oriented user interface and is ideal for quick prototyping of complex images. It includes text and graphics editors, incremental compiler, debugging



tools and multiple-window management capabilities.

Other languages are optionally available. Tek Common Lisp is a full implementation of the newly emerging standard. MPROLOG, a dialect of Prolog, is based on logic programming principles. Franz Lisp is widely known and used by many AI researchers and computer science innovators. An optional EMACS visual text editor provides rapid source entry and manipulation no matter which programming environment is employed.

### High performance microprocessor system

The Tek 4405 includes a Motorola 68020 microprocessor operating at 16 Mhz. A high speed 68881 floating point co-processor and a full megabyte of dynamic RAM provide the necessary power and throughput for AI applications. An additional 2 or 4 Mbytes of RAM are optional.

Mass storage includes a 45 Mbyte hard disk and 320 Kbyte floppy. An optional 90 Mbyte hard disk is available to replace the standard hard disk (4405 Opt. 21). For additional disk storage and backup, the 4944 Mass Storage Unit may be employed.

This provides incremental 90 Mbyte hard disks (4944 Opt. 02) and streaming tape drives (4944 Opt. 01) for data backup.

### Virtual memory operating system

The Tek 4405 is supplied with a Unix-like virtual memory operating system which supports multitasking. A 32 Mbyte virtual memory address provides needed space for often complex AI applications without resorting to segmentation or overlays. A set of utility programs including an assembler, C compiler and standard I/O library is also provided.

### Highly interactive user interface

A bit-mapped graphics display with mouse input is closely coupled to the processor for a state-of-the-art user-interface. The 13" monochrome display has 640-by-480 pixel resolution and operates at 60 Hz, non-interlaced. It functions as a window into a 1024-by-1024 bit-map memory with smooth panning whenever the cursor reaches a physical display edge.

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## Flexible communications for added utility

The Tek 4405 may be connected to a number of peripherals and also functions as part of a larger environment. VT100 (ANSI x3.64) terminal emulation enhances communication with mainframes through the 4405's standard RS-232 port. An optional IEEE standard, TCP/IP protocol Ethernet interface provides local area network.

## Tektronix reliability and support

Like all Tek products, the 4405 is serviced through a world-wide network of sales and service centers. The 4405 has a standard 90 day hardware warranty with optional one year coverage. A one year software update service is included with each system and can be renewed on an annual basis. Tektronix' commitment to its artificial intelligence customers also includes several specialized AI regional support centers across the country.

## Specifications

The Tek 4405 Artificial Intelligence System offers these standard features:

- Smalltalk-80 programming environment
- Motorola 68020 32-bit microprocessor
- 68881 floating point co-processor
- 1 Mbyte high-speed dynamic RAM memory
- Virtual memory operating system with multi-tasking and hierarchical file structure
- C compiler with standard I/O library
- Virtual memory management for 32 Mbyte address space
- 640 x 480 monochrome, bit-mapped display, 60 Hz, non-interlaced
- 1024 x 1024 bit-mapped display address space with smooth panning
- Three button mouse
- 45 Mbyte, 5¼ inch hard disk and 320 Kbyte, 5¼ inch floppy disk
- ANSI x3.64 (VT100) terminal emulation
- SCSI interface
- RS-232C communications interface with host communications/file transfer utility
- Centronics-style parallel hard copy interface characters; 14-key numeric keypad; 4 special and 8 dedicated programmable function keys; N-key rollover and joydisk
- Programmable sound generator
- Crystal-controlled clock/calendar with battery backup
- ROM/EPROM expansion sockets
- Meets the requirements of UL 478, UL 114 VDE 110, CSA 154, and IEC 435

Smalltalk-80 is a trademark of Xerox Corporation  
MPROLOG is a trademark of Logicware, Inc.  
Franz Lisp is a trademark of Franz, Inc.  
Unix is a trademark of AT&T Bell Labs  
VT100 is a trademark of Digital Equipment Corporation

## 4405 Performance Characteristics

|                                |                              |  |                   |
|--------------------------------|------------------------------|--|-------------------|
| <b>Display Size</b>            | 330 mm (13 in)               | <b>Hardware Panning</b>                | Yes               |
| Viewing Area                   | 241 x 178 mm<br>(9.5 x 7 in) | <b>Communications</b>                  | RS-232-C          |
| <b>Terminal Emulation</b>      | ANSI X3.64                   | <b>Maximum Baud Rate With Flagging</b> | 9600 Baud         |
| 80 Characters x 32 Lines       |                              | <b>Hard Disk Capacity</b>              | Formatted 45.0 MB |
| <b>Bit-Map Resolution</b>      | Viewable Points 640 x 480    | <b>Flexible Disk Capacity</b>          | Formatted 320 KB  |
| Addressable Points 1024 x 1024 |                              |  |                   |
| <b>Pointing Devices</b>        | Joydisk                      |  |                   |
| Mouse                          |                              |  |                   |

### Physical Characteristics

#### CPU Module

|        |   |
|--------|---|
| Width  | 419 mm (16.5 in)                        |
| Height | 353 mm (13.9 in)                        |
| Depth  | 495 mm (19.5 in plus<br>3.0 for cables) |
| Weight | 20 Kg (44 lbs)                          |

#### Mass Storage Module

|        |                      |
|--------|----------------------|
| Width  | 368.3 mm (14.5 in)   |
| Height | 127.64 mm (5.025 in) |
| Depth  | 433.07 mm (17.05 in) |
| Weight | 6.35 Kg (14 lbs)     |

### Environmental Characteristics

Operating Temperature 10 to 40°C  
Humidity 10 to 75% relative humidity, non-condensing

### Safety Information

Meets the requirements of UL 478, UL 114, VDE 110, CSA 154 and IEC 435

### Line Voltage

115V (nominal); 87-128V; 230V (nominal); 174-250V at 48-66Hz

### System Input Power

Less than 200W Operating

## Options and Accessories

### 4405 Hardware Options

- Opt. 02 Additional 2 MB Memory
- Opt. 04 Additional 4 MB Memory
- Opt. 10 Ethernet Interface
- Opt. 21 90 MB Hard Disk (replaces standard 45 MB hard disk)
- Opt. A1 Universal European 220V/16A Power Cord
- Opt. A2 United Kingdom 240V/13A, Power Cord
- Opt. A3 Australian 240V/15A Power Cord
- Opt. A4 North American 115V/15A Power Cord
- Opt. A5 Swiss 220V/6A Power Cord

### 4405 Software Options

- 4400P30 Opt. 05 Franz Lisp Programming Language
- 4400P31 Opt. 05 MPROLOG Programming Language
- 4400P32 Opt. 05 EMACS Editor
- 4400P33 Opt. 05 Tek Common Lisp Programming Language

### Accessories

- 4405 User's Manual
- 4405 Reference Manual
- Introduction to Smalltalk Manual
- 2 Power Cords
- Standard Keyboard
- RS-232-C Cable
- SCSI Cable and SCSI Terminator
- 3-Button Mouse

For further information, contact:

**U.S.A., Asia, Australia, Central & South America, Japan**

Tektronix, Inc.

P.O. Box 1700

Beaverton, Oregon 97075

For additional literature, or the address and phone number of the Tektronix Sales Office nearest you, contact:

Phone: (800) 547-1512

Oregon only: (800) 452-1877

TWX: (910) 467-8708

TLX: 151754

Cable: TEKWSGT

**Europe, Africa, Middle East**

Tektronix Europe B.V.

European Headquarters

Postbox 827

1180 AV Amstelveen

The Netherlands

Phone: (20) 471146

Telex: 18312 - 18328

**Canada**

Tektronix Canada Inc.

P.O. Box 6500


Barrie, Ontario L4M 4V3

Phone: (705) 737-2700

Specifications may change without notice.

**OEM prices and leasing programs (U.S. only) are available.**

Some of the products, options or services mentioned in this brochure may not be available outside the USA. Contact your local Tektronix representative for details.

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